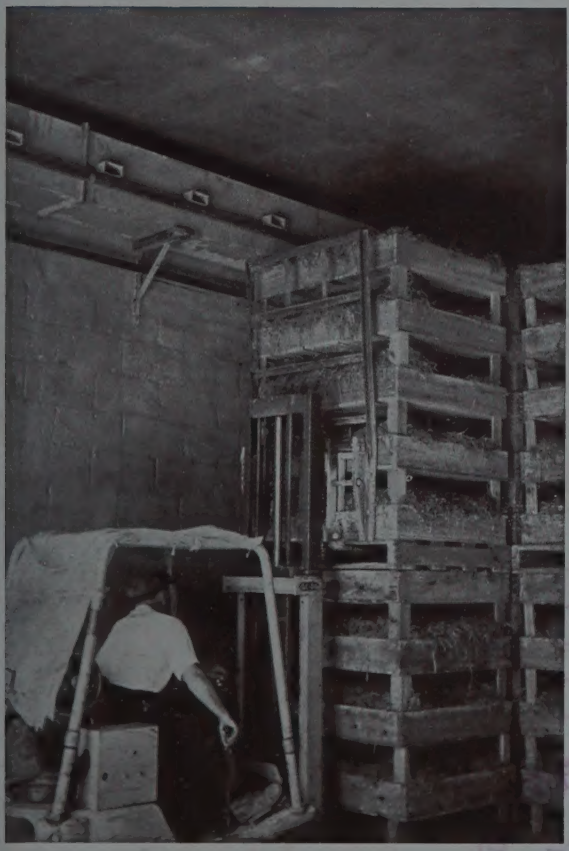
DARLINGTON'S

Mushroom News

A QUARTERLY JOURNAL FOR MUSHROOM GROWERS

Vol. VIII No. 5 JULY 1961



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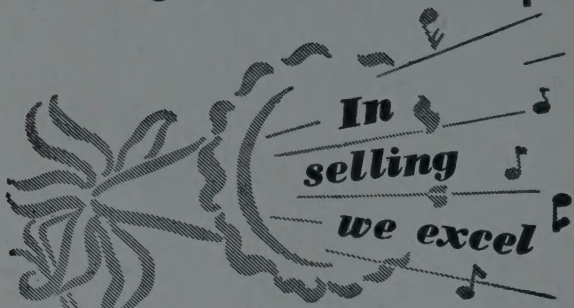

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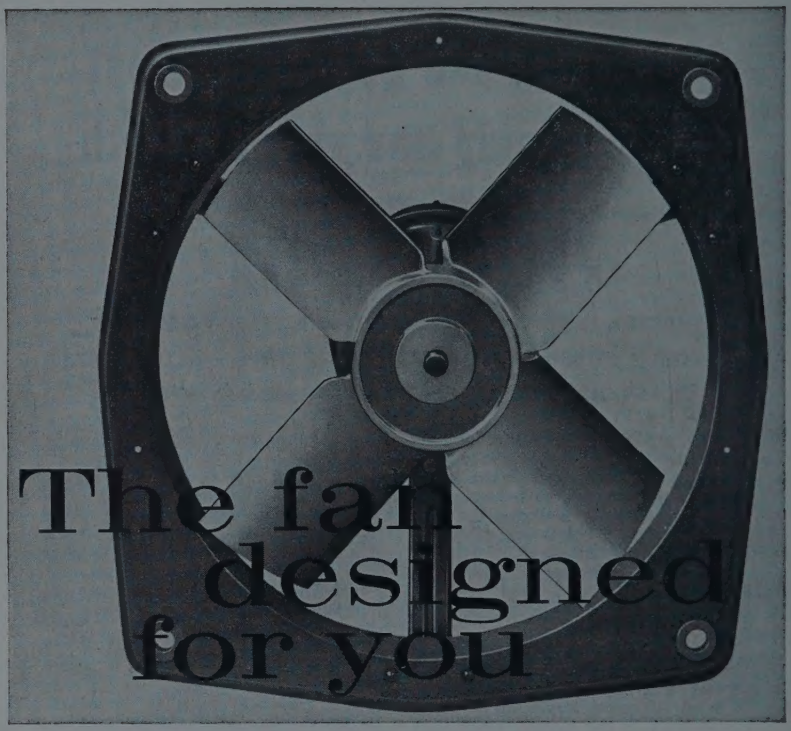

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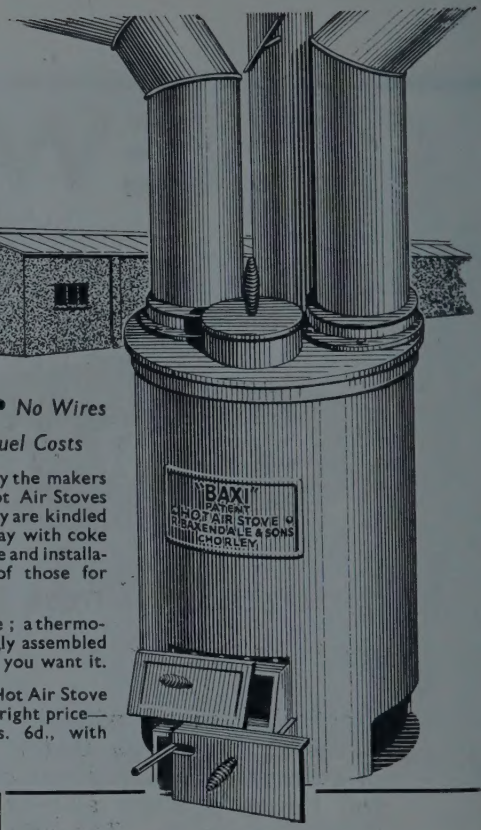

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Mushroom News

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OUR FRONT COVER

Open-stacked trays being put into one of the new heat rooms at Darlington's Experimental Farm at Angmering. Details of these heat rooms and of the recently constructed spawn running rooms are described in the article "Building a New Processing Area" in this issue.

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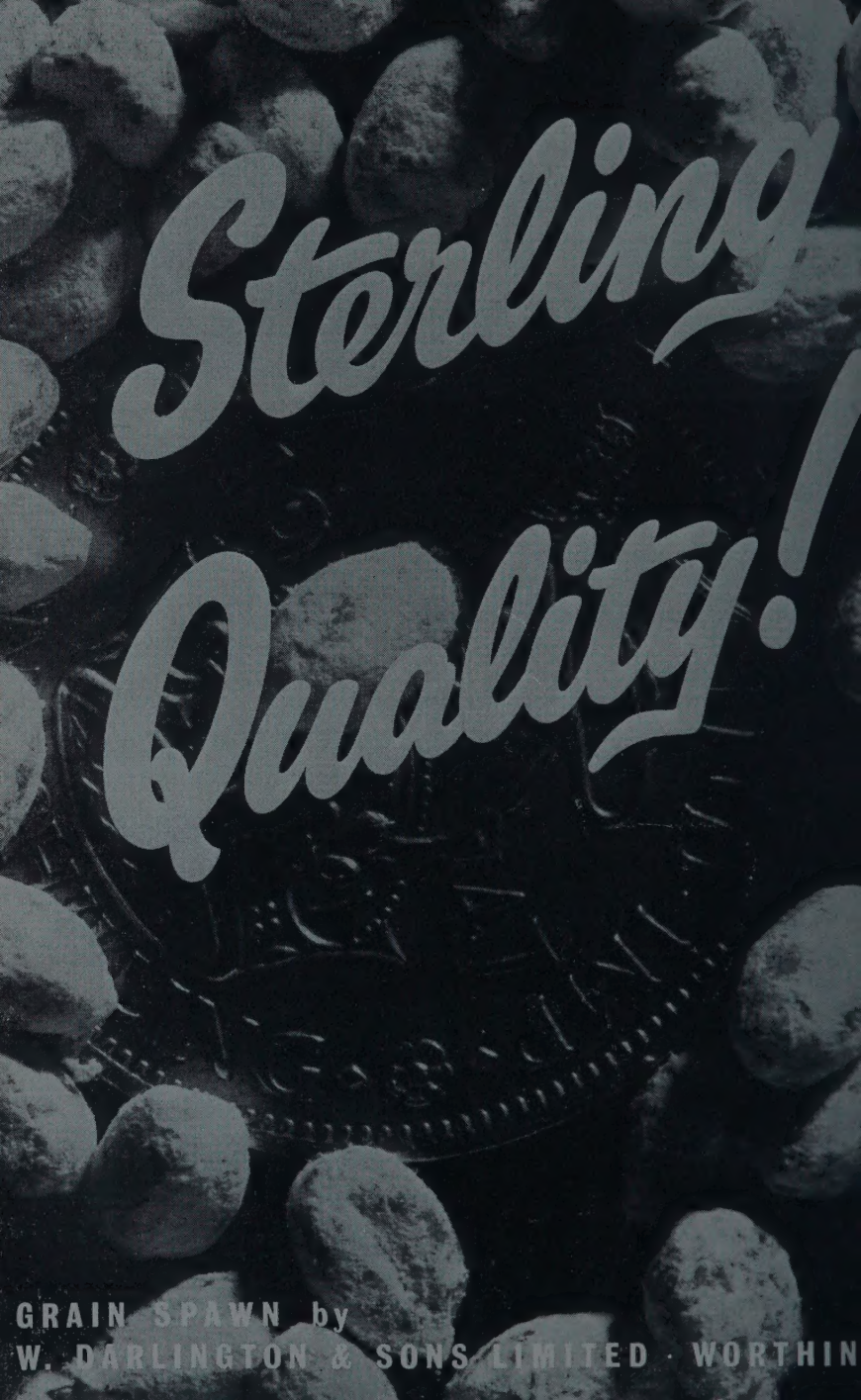
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WORTHING ENGLAND

Vol. VIII No. 5 **JULY 1961**

The Challenge

As we go to press we learn that the Government has decided to apply for membership of the European Economic Community or Common Market, and the first step will be taken on a course that may well affect all the inhabitants, present and future, of the United Kingdom. In this issue of our journal we have included an article that endeavours to set out impartially some of the pros and cons of the great debate on the Common Market, and we hope that it may give our readers some guidance as to what may happen.

Nevertheless to apply for membership of a club is one thing. To be accorded full membership is another, and there will undoubtedly be a great deal of hard bargaining during the next 12 months to make the best possible terms with the countries of the Common Market. It may be that in the end the price demanded will be too high, and we shall withdraw our application.

We think that growers have always been far too defensive in their attitude towards the Continent. Any suggestion of increased trade has always brought forth a sustained cry for help, as though continental growers were supermen, always capable of beating the home grower in price, in quality and in presentation. Perhaps this fear of invasion is understandable in view of the tremendous propaganda generated in the popular press about the horticultural efficiency of countries such as Holland, coupled with our national talent for running our own products down to such an extent that we convince even ourselves of our inefficiency.

So let it be said loudly and clearly that the mushroom industry in this country is the most productive, the most efficient in Europe. So long as it maintains its lead over other European producers it has nothing to fear in the future.

But growers abroad are not standing still, and certainly so far as Holland is concerned, their rate of technical progress is probably better than in this country, because they have a lot to learn and they have every opportunity to learn it, while growers here are largely seeking new and improved methods that must be tried and tested on the farm. Within ten years the Dutch growers may well have as efficient production as the United Kingdom.

What, then, if there are no tariffs and quotas to protect the mushroom industry? The Dutch are the most efficient distributors of horticultural produce in Europe. Given equal efficiency in production we can

expect them to mount a full scale invasion of the English markets, spearheaded by excellent quality mushrooms, superbly packed, rapidly distributed and efficiently marketed. Then indeed will English growers have something to worry about!

This probable future challenge can be met now. There will be several years during which horticulture will stand behind dwindling tariff and quota walls, and during this period of grace it must increase its efficiency to meet a new era of competition. For the mushroom grower this means two things. Firstly, technical efficiency must be maintained so that the lead over continental competitors is not lost. Secondly, new methods of marketing and distribution must be introduced. Ever increasing attention must be given to *selling* mushrooms.

If growers will devote as much attention to the welfare of the mushroom after it has been picked as they do to it while it is growing, their future is not in danger. In fact there is no reason at all why English mushrooms should not invade the continent, and threaten the markets in West Germany and Belgium, the two nearby importing countries. It is claimed that the standard of living in the Common Market is rising rapidly. We know that a rising standard of living can be measured by the *per capita* consumption of mushrooms, and that the demand for mushrooms in the Common Market will be immense.

Let us for once take a positive attitude over mushrooms, and lay plans now to see that English mushrooms sell in all the capitals of Western Europe. It will need much initiative, imagination and co-operation, but the mushroom industry has never been deficient in these qualities. If the United Kingdom is going into the Common Market, then let our approach be aggressive so that every ounce of benefit can be wrung from the vast potential market open to us.

Notes and News

Cancer Research

Reports have reached us from several sources that Japanese scientists claim to have discovered in mushrooms a substance that can combat cancerous growths.

While details are not yet available, it is to be hoped that the substance lives up to expectations, and that it will help to relieve humanity of its most feared scourge.

France the Garden of Europe?

France, with surpluses of fruit and vegetables, is determined to become the market garden of the Common Market. The government are giving the industry every encouragement (and inducement) to export to the other E.E.C. countries, and there is no doubt that a streamlined horticulture will result.

Red Tomatoes

A section of the Russian Industrial Exhibition at Earl's Court was devoted to horticulture. Figures show that glass coverage has risen to a million and three quarter square yards in 1960—no less than thirty-seven times the area of glass available in 1913.

Films show recent developments in horticulture, including the growing of winter tomatoes on a State Nursery near Moscow.

"Housewives' Charter" Delayed

There is no chance now that the Weights & Measures Bill will be passed this session. The bill has been passed by the Lords, but the Commons' legislative programme is so far behind that the bill will be abandoned.

So far as growers are concerned, the main influence of the bill would be on pre-packs and direct retail sales. They would be obliged to make known to the customer the weight of produce and container at the time of sale. The object of the bill is to remove guesswork as to quantity when the housewife buys.

"Why don't mushrooms taste . . .?"

It appears that sensitivity to taste decreases with advancing age. According to an article on Taste and Flavour in the Report of the Agricultural Research Council, taste is apprehended by receptors situated in organs known as taste buds and these buds begin to atrophy after the age of 45.

This rather knocks the stuffing out of those who are constantly claiming that food today is tasteless, and that fifty years ago "before artificials were used", everything was so much more delicious.

Enquire Within

The International Plant Index staff have completed 50,000 reference cards of the estimated 1,700,000 cards that will catalogue all the earth's known plant life.

Some growers may have consulted the Index Kewensis, which consists of thirteen volumes of flowering plants. This Index was the result of a donation by Charles Darwin in 1895, and the International Plant Index will no doubt call heavily upon this existing reference system.

Mushrooms from Formosa

The Chinese Nationalist Government hope to export one hundred thousand cases of canned mushrooms this year, mainly to the United States, and earn some 1,300,000 dollars.

This is a new crop for Taiwan farmers, and they have been advised and assisted by American experts. The farmers anticipate a profit of 120% on their investment; no wonder they plan to double their output next year!

A Vital Question !

One is sometimes surprised by the things that the scientist does *not* know, and a report from the *New Zealand Herald* emphasises this point. How does an entomologist know whether a fly is dead—or just shamming?

It is a more important matter than one imagines, because a new insecticide under test may knock out a lot of flies, and it is then rather vital to know whether the recumbent insects are very dead, or just paralysed. It is no good reporting a 100% kill, if 95% subsequently get up and walk away.

Dr. D. Spiller of New Zealand discovered when working at Cambridge that a dead insect dehydrates very much faster than a live one. It is true that the amount of water involved is minute, but nevertheless it is measurable using electronic means.

By weighing the insects during the trials, and recording variations in body-weights, Dr. Spiller can get a very good picture of the lethal as opposed to the paralysing effect of an insecticide.

BUILDING A NEW PROCESSING AREA

The answers to a number of questions about work in progress at Darlington's Experimental Farm are given here, where the details of the new processing area are discussed, and both methods of construction and materials used are set out.

PROPERLY constructed heat and spawn running rooms have become an essential part of the modern mushroom farm, and an increasing number of growers are constructing buildings for this purpose. Visitors to Darlingtons Experimental Farm have seen the new processing area that is in course of construction and have asked many questions concerning the materials and methods used. For the benefit of those growers who have been unable to visit the farm we decided to set out the main features of the new constructions.

The processing area must be viewed as a whole, and incorporates:

(a) A composting yard.
(b) Heat rooms.
(c) A covered area for spawning.
(d) Spawn running rooms.

With spawn run, the trays are removed from the processing area to the growing houses. In addition to the above-listed major requirements, there must be good access roads to the composting yard for the delivery of manure, and concrete roads or paths from the spawn running rooms to the growing houses capable of taking the weight of fork lift trucks.

In "Mushroom News", April 1961 we discussed in some detail the specification for a suitable composting yard in the article on the Linfield Turner, so we will move on to the rest of the processing area.

Ideally the compost should flow through the area, without backtracking, deviation or delay. At the Experimental Farm this

The central covered gallery taken from the heat room side, looking across at the spawn-running rooms.

The southern end of the heat rooms face on to the composting yard. There are two blocks, each of two, as shown here.

object has been achieved by fronting the four heat rooms on to the composting yard. At the rear of the heat rooms will be a covered area for spawning, and then the four spawn running rooms. The exit from these rooms is on to a road that leads directly to the growing houses.

But this sequence of operations—composting, pasteurising, spawning, running and casing—should be studied not only from the angle of advantageous handling. A vital factor is that during the critical stage between composting and casing, the actual compost does not leave the one large building. In this way the problem of protecting the compost when it is most vulnerable to the attacks of flies and of air and dust-borne diseases, is considerably simplified. This was a significant factor in the decision to make a covered way between the heat rooms and spawn running rooms at the Experimental Farm.

The layout in this sequence is the first step towards more intensive mechanisation of the operations of mushroom growing, and at present a study is being conducted into the mechanical filling of trays, automatic handling of trays into the spawning machine, mechanical tamping after spawning, and in particular automatic and simultaneous wetting, mixing and pasteurising of casing materials. Details of these studies will appear in later issues of "Mushroom News".

The basic measurements of the heat and spawn running rooms are fifty feet long, twenty feet wide and fourteen feet six inches high, giving a volume of 14,500 cubic feet. Such a room takes five hundred of the ten and a half square foot trays that are standard equipment on the farm, or an area of 5,500 square feet of compost.

For the benefit of those growers who have not seen the standard tray in use on the experimental farm, the

The hollow clay blocks used for the external walls. Various sizes can be supplied to save cutting.

Filling the 10 square foot trays after thorough aeration both by machine and hand. In the background two of the block of four heat rooms can be seen.

details are as follows. The trays measure 46 inches by 36 inches, and are 6⅝ inches deep. The trays are fitted with corner pegs which project 7½ inches above the sides of the tray, and the trays are normally open-stacked When filled the compost is left very loose in the trays to encourage "breathing" during pasteurisation. With the open-stacked trays there is adequate space above the compost for air circulation.

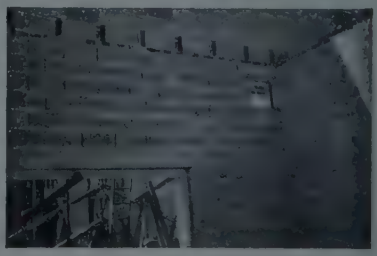
The trays are filled manually in the composting yard after going through the turning machine. The compost is fluffed out by the machine and is then thoroughly shaken out with a dung fork as it is placed in each tray. This is considered to be one of the most important operations, and if the trays are not filled correctly, either by pushing in lumps of compost, or by tamping down the compost after filling, then the ensuing heat treatment of the compost may not be satisfactory.

As the trays are filled they are assembled on pallets in stacks of five, and are carried by fork lift truck into the heat room.

Throughout all the buildings in the processing area, the walls are of cavity construction with a two inch air space between inner and outer "skin". However there is some variation in the building materials used, depending upon whether the walls are external or internal, and also a variation between insulation and finish in those rooms used for heat treatment and those for incubation.

All internal walls are constructed of foam slag blocks 4 inches thick. In party walls, both skins are of the foam slag blocks, but for external walls the outer skin is of hollow clay tiles 4 inches thick.

As the foamed slag block is the principal building material used in the construction, we give some details of its specification. It measures 18 inches long by 8⅝ inches high, and is 4 inches thick. It has a density of 77 lb. per cubic foot, and a crushing strength of 602 lb. per sq. inch.

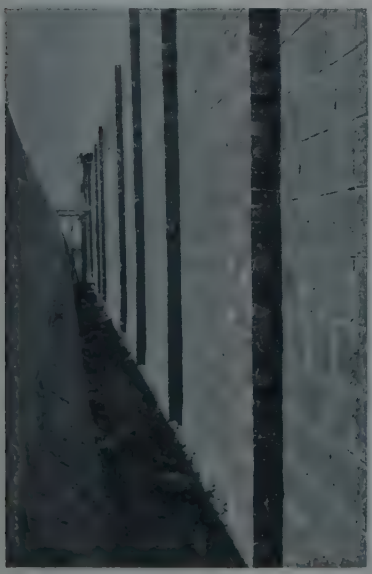


A corner of one of the spawn running rooms, Provision has been made for a ventilator and the gaps are for ceiling joists.

The ducting system in the heat rooms. The top duct is of metal, the bottom of wood so that it can be easily repaired if damaged by a fork lift truck.

Its insulation values are interesting. A similar block made of concrete with normal aggregate has a K factor of 5.94, but the foamed slag block has a K factor of only 2.07! Used in construction, a party wall of foamed slag blocks with a 2 inch unfilled cavity, rendered with sand and cement has a U value of 0.14, and an exterior wall with clay bricks on the outside, 2 inch cavity and foamed slag with rendering on the inside has a U value of 0.20.

For the heatrooms, the make-up of the walls is as follows. First the external wall of hollow clay tiles, then a 2 inch cavity, then the foam slag blocks. The internal surface is rendered with sand, cement and lime mortar to give a good finish, and is then given a coat of Foliac Graphite Paste, trowelled on by hand followed by a coat of vapour-proof aluminium paint. A further layer of foliac and of aluminium paint completes the wall finish. The object of this intensive moisture and vapour-proofing is to provide as perfect and durable a vapour barrier as possible. This is essential to protect the insulation and walls from moisture penetration and consequent loss of efficiency.



The ceilings of the heat rooms are also heavily insulated and similarly vapour-proofed. The ceiling itself consists of expanded metal sheeting and Marlith Board, below which is the sand, cement and lime rendering, sealed with two coats of Foliac and of vapour proof aluminium paint. Above the ceiling, there is a base of wire netting stretched over the joists, and then four thicknesses of Fibreglass Crown 75.

For the spawn running rooms, the wall and roof treatment is much simpler. The inner walls of foam slag blocks are rendered and then finished with aluminium paint for cleanliness and appearance, and the ceiling is of asbestos sheeting with fibreglass over. Heavy insulation

An exterior wall of the processing area. The wall is of hollow clay tiles, with brick-built pillars to support the roof trusses.

Interior wall of a spawn running room during construction. The brick piers built into the foam slag blocks take the weight of the 42ft. trusses.

and moisture-proofing are an unnecessary expense for these rooms.

The rooms are all 14 ft. 6 in. to the eaves, and then above them is a gabled roof. One span covers two rooms, i.e. has a 42 ft. truss, rising to 26 ft. at the apex. The trusses are equally spaced between the gables at the ends, and there are three to the length of the house. The external roofing material is corrugated asbestos sheeting. Doors are sliding, with aluminium sheets protecting expanded polystyrene insulation in the centre, and inner doors, opening into the central gallery, have smaller doors cut in them for quick entry or exit.

The central gallery measures 84 feet long by 36 feet wide, and a massive steel joist runs across at eaves height halfway along its length. This load-bearing joist enables the same size roof trusses to be used to cover the gallery under two ridges.

In view of the size and weight of the trusses, it has been necessary to build brick piers into the walls to carry the load. On external walls, part of the pier stands out as a buttress, the remainder being built into the wall, as can clearly be seen in the illustrations.

The whole of the processing area has 6 inches of concrete underfoot, enough to carry the weight of the most heavily laden fork lift truck. Plenty of water faucets are provided to enable hosing down and scrubbing of the surface and walls after every operation.

BOOK REVIEW

Money From Mushrooms—*The Diary of a Grower* by Roy Genders, published by Land Books, 21/-.

The difficulty in writing a book about mushroom growing is that the subject advances at a rather smarter pace than the author. By the time the fourth chapter is written, the first chapter is ripe for revision, and when the book is completed and comes back in proof form from the publishers, the author has an insane desire to tear the whole thing up and start again.

Roy Genders, in his latest book, avoids this difficulty by calling it "The Diary of a Grower", and uses

his own experiences over the last 30 years as a theme on which to build. The result is a readable book, controversial in places, full of practical information for the man considering taking up commercial cultivation.

Nevertheless it raises a question that no responsible person, whether grower or sundriesman, can ignore; the advice to be given to the man who wants to grow mushrooms. On the one hand it is possible to be unduly pessimistic, stressing the many obstacles that stand between the beginner and success—and only the experienced grower knows just how many obstacles there are! The thoroughly discouraged tyro then goes round the corner and meets the man who has built up a 10,000 square foot farm on nothing but credit and sweat, and the tyro feels he has been misled and that the mushroom industry is antagonistic to the entry of "new blood".

On the other hand, it is possible to paint an optimistic picture of the prospects, minimising the dangers to invested capital. It is easy to say that yields *ought* to be 1½ to 2 lb. per square foot in 6 weeks, that annual gross profit should be between 12/6d. and 15/- per square foot per annum. Knowledge that gives such returns has often been dearly bought over several years.

Roy Genders' book is aimed primarily at the smallholder, the man with a bit of ground and some out-buildings, the city man with the old manor house in the country. Such people are anxious to earn money from every inch of ground and every bit of cover in order to pay their overheads, and the prospect of "money from mushrooms" is attractive. I think that after reading this book they will have a clear idea as to how to grow mushrooms, and they should be able to produce a crop. But whether they will be able to make money from it is another matter.

Of course there may be local conditions such as a nearby town and no competitors, that allow a small grower to have a direct sale and high average prices all the year round. But in my opinion the day of the converted cowshed, the cellar and the stable, used for commercial mushroom growing, is over. The cost of making them into satisfactory mushroom houses is so high that it would be better to build the proper mushroom houses from the start. Moreover the growing house is now only a section of the farm. There must be a concrete composting yard, a heat room, possibly spawn running rooms.

That is not to say that valuable experience cannot be gained by growing a few crops using the stable yard for composting, the loose boxes for growing and so on. After a remarkably short space of time the grower will reach the point of no return. To go on will mean increasingly heavy investment, more work, more worry, and the hope of a prosperous mushroom farm. That is the time to call a halt if you are not prepared to become a dedicated man.

Roy Genders' book will bring a lot of people successfully to that point. He makes mushroom growing sound exciting—which it is. He also tends to make it sound easy—which it is not. I doubt if anyone will invest their life savings in mushroom growing as a result of reading the book, but it may well be that ten years from now one or two big growers, looking back in reminiscence, will bless (or blast!) those pages for starting them along the mushroom trail.

HOLLY GROVE REVISITE

Readers will be interested in this article covering the return to a farm last visited in 1952, *because they will see how a modern grower has kept up with the pressure of events. In particular, Mr. Dowmunt has tackled the problem of mechanisation by adaption and ingenuity that has given him what he wants at a reasonably low cost.*

WHAT have twelve years of mushroom growing brought to Mr. Dowmunt? He laughed at the question and pointed to his head. "A lot of grey hairs," he answered, "a lot of overdraft at the bank. But seriously, it has been good fun and well worth it."

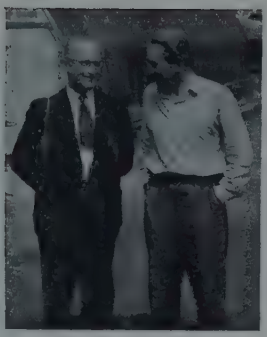
Regular readers of "Mushroom News" will remember that Holly Grove Farm, Newick, was one of the first farms we visited in the series "Modern Mushroom Farms". We decided to call again, after nine years absence, and see how the farm — and Mr. Dowmunt — had changed.

One thing had not changed. The setting of the farm is perfect, and sitting in Mr. Dowmunt's garden one can look out across six miles of unspoiled Sussex countryside to the slopes of the Downs about Lewes. Glyndebourne is quarter of an hour away by car, London an hour by train. On a hot summer's day it is a small oasis of peace set in a network of roads.

But if the country around Holly Grove Farm still preserves its tranquillity, the farm beyond the garden wall has changed enormously. For a start it is now over twice as big, with a standing area of 12,000 sq. ft.

Eight of the purpose-built cropping houses, of cavity breeze blocks, with false ceilings below the ridge roofs.

FARM



Mr. Dowmunt talking to Mr. F. C. Wood of W. Darlington & Sons Ltd.

on shelves and 12,000 square feet on trays. Such an expansion has called for many other changes in the organisation of the farm, and Mr. Dowmunt has concentrated upon reducing his labour costs by mechanisation while keeping his capital outlay on machinery within reasonable limits.

In 1952 we wrote "Convinced that composting is, if not the most important, certainly one of the most important operations in mushroom growing, Mr. Dowmunt goes to endless trouble to ensure that the heap is turned outside to inside and top to bottom."

Mr. Dowmunt has not changed his views on the importance of correct composting, but everything else has changed. He now has an imposing yard that is large enough to cater for his composting requirements for years ahead. Furthermore the traditional composting method has been replaced by rapid composting, and hand labour by machinery.

The dung is layered with chicken manure on arrival, and a rough stack made. As each layer of chicken manure is spread it is thoroughly consolidated by driving a tractor over it, and water is added liberally through two one-inch hoses. The dry chicken litter is put in at approximately 5% by weight, and then the compost is supplemented with Adco "M" after a nitrogen determination has been made by Darlington's Analytical Laboratories.

This initial rough stacking and layering is carried out on a Friday, and the first proper turn is made on the Tuesday following, accompanied by heavy watering. It is now that the sample is taken for analysis, and according to the laboratory recommendation, Adco "M" is added on the second turn which takes place on Thursday. A third turn is made on Sunday, with a final turn into the trays on Tuesday.

All the turning is done mechanically with an Atkinson Manure Spreader modified to Mr. Dowmunt's own design. Basically the machine consists of an endless belt four feet four inches wide feeding to two spiked rollers, each carrying four lines of tines, and in normal agricultural use the feeding belt is horizontal so that the dung is discharged on to the field. Mr. Dowmunt has raised the delivery end of the machine 2 feet 6 inches by means of metal plates, and it now discharges at a height that allows stacking up to 6 feet high. On the discharge side of the spiked rollers he has

The Atkinson Manure Spreader converted to use as a composting machine. Note how the delivery end has been raised to give good stacking.

placed two high pressure spray lines, and intends to fix a third line on the feed side of the rollers.

The machine is driven by a power take-off shaft from a Fordson tractor, and the speed of the endless belt, and therefore of the throughput can be controlled by an independent rachet mechanism. This speed is varied with the stage of composting; if more water is required, the belt is slowed down, and if, as on later turns, aeration only is required, then it can be speeded up.

The belt is fed with compost by a Ferguson tractor using a high lift, and Mr. Dowmunt reckons that he can put through 20 tons of dung in an average time of 2½ hours, using the labour of three men. The advantage of the Atkinson Spreader is that there is relatively little wear and tear, for the belt feed is direct driven by rollers, and moves slowly, inching its way forward. Mr. Dowmunt found that with the purpose-built turners where chains are employed, he had a great deal of trouble from the chains, and incidental damage caused when the chain broke. Furthermore, feeding the machine is much easier, for the belt is wide and the slope is easy. The machine is constructed to stand up to the heavy mauling it is likely to get on an agricultural holding, and the relatively quiet life of a mushroom farm puts considerably less strain on it!

Here it is interesting to note another change that has occurred in the last nine years. When "Mushroom News" last visited Mr. Dowmunt's farm he gave a very lucid and detailed description of his method of composting, but nowhere can we find a reference to man-hours. Today it is very different; every job on the farm has been subjected to scrutiny to see how it can best be done with the minimum labour and maximum mechanical efficiency.

For filling the trays, a hood is fixed to the Atkinson, and the compost, well aerated, drops into the tray as it stands on a roller conveyor. The conveyor carries the tray along towards the heat room, and in transit its contents are checked for density. At the heat room door the trays are placed on pallets, and made up into stacks of eight, two such stacks being treated as a unit for movement purposes. Blocks of wood 2 inches high are placed at each of the four corners of the trays so that the total gap between trays is about four inches, and the loosely piled compost fills about half this space. With 16 trays on the two pallets, a stillage truck is run under them and they are moved into the heat room.

The trays are Norwegian fish boxes. Mr. Dowmunt finds these a more attractive proposition than the Danish boxes for they are larger and deeper, and considerably stronger, but he wants to go over as soon as possible to purpose-built trays but is

The stillage truck and one of the pallets. Sixteen trays can be moved at one time with the truck.

held back by the cost of such a re-equipment, which will be very high.

All the trays for the tray section of the farm are processed in the heat room. Auxiliary heat is provided by four banks of gilled tubing and one steam line running along one wall. A large blower type fan recirculates air in the house through metal ducting running at roof level, the air being picked up by a corresponding duct running at floor level. There are two "chimneys"—one at each end of the house—giving a clear up draught from the house.

Arrangements for pasteurising the compost for the shelf beds are not so satisfactory and at present this is carried out in the actual growing houses. Mr. Dowmunt plans, however, to build a new heat room in the immediate future, and all the compost for the shelf beds will be processed in trays and then emptied on to the shelves. Ultimately the trays will be spawned, passed through spawn-running rooms, and then emptied on to the shelves before casing.

For spawning, Mr. Dowmunt has contrived a most useful machine out of an old DLP Composter. With it, 3,000 square feet can be spawned in approximately 5 hours, with 6 workers attending. The trays of compost are brought to the machine from the heat rooms on stillage trucks or roller conveyors, and are emptied into the feeding side of the DLP, spread with grain spawn and passed to the combs where spawn and compost are thoroughly intermixed. The mixture drops down on to a second line of roller conveyors, and is run off for tamping and consolidating. This is yet another application of the versatile DLP, which was originally designed at Yaxley as a manure turner, appeared at Oxted as the ideal machine for aeration and filling trays, and now serves as a spawning machine at Newick!

Mr. Dowmunt spawns at 25-28

The composting machine delivers the compost into a solid timber framework that shapes the heap. The men are levelling off, and stand on shelves to do so.

The D.L.P. Composting Machine which has been converted for use as a spawning machine. The trays arrive and depart on roller conveyors.

square feet to the carton and admits that heavier spawning is advantageous. As he consolidates his position he fully intends to spawn increasingly heavily to obtain full advantage of the faster spawn run and earlier cropping that result.

Casing is carried out by hand, using a mixture of equal parts of Irish Peat and chalk. Mr. Dowmunt is not satisfied that any of the mechanical casing devices he has seen offers a satisfactory alternative to the manual method, but that does not mean he rules out mechanical casing as a possibility. Anything that will do the job efficiently and save labour on a mushroom farm must be seriously considered if a grower is to stay in business.

We asked Mr. Dowmunt why he had not gone over completely to trays, and he pointed out that the purpose-built houses he put up originally were designed for shelf-growing and it was not economical to put trays in them. They are built of cavity breeze blocks 18 inches by 18 inches by 9 inches thick, and the cavities are filled with rock wool to increase their insulation value. They measure 40 feet 6 inches long by 16 feet 6 inches wide, and have false ceilings insulated with rock wool.

He does not find it difficult to organise a farm that is half on trays and half on shelves, and reckons that it is only a matter of planning ahead. On the shelves he takes 3 crops in 48 weeks, and averages 2½lb. per square foot. On the trays, he takes 5 crops in 50 weeks, and has been cropping an average of 1½lb. per square foot in 6 weeks. From this it can be seen that he is not doing too badly.

For the immediate future he is planning to build a new heat room fronting on to the composting yard, and to incorporate spawn running rooms in his programme. The next

The composting yard. On the right, manure is stacked on delivery, and layered with chicken manure.

A corner of the existing heat room, showing the ducting arrangements. and the four rows of gilled tubing.

step will be to tie in his whole cropping programme with the heat and spawn running rooms, so that all the compost is processed and run in trays, and then goes either to the tray houses or for tipping out on to the shelves.

In nine years of growing, Mr. Dowmunt has had his ups and downs. Asked what he liked least to remember, he said that it would be the period of change over from traditional to rapid composting.

He reckoned that on the average farm it takes from 1½ to 2 years to master the rapid fermentation process, and there are times during those years when he felt defeated to the point of giving up growing altogether. Nevertheless it is experience that has to be bought, and growers will have to master rapid composting if they are to compete in the future. The combination of the yard and the heat room to process the compost is a technique that calls for all the growers' attention, and there is no easy route, no short cut to success. Mr. Dowmunt is one of relatively few moderately-sized growers who have graduated after a lengthy and painful course of instruction.

THE DUTCH INDUSTRY

An Open Day was held at the Dutch Mushroom Research Station on the 16th June, and the Director, Dr. P. J. Bels, gave some interesting statistics to the 550 people who attended.

Production of mushrooms in Holland has climbed steadily from 2.4 million pounds in 1955 to 6.16 million pounds in 1960, and the estimated production for 1961 will be over 7.7 million pounds.

Some idea of the home market can be gained from the figures of exports given. Thus in 1955, 41% of the mushrooms were exported, but as production expanded the percentage rose until it reached 67% in 1959.

Most of the Dutch exports, whether fresh or canned, go to Belgium and Luxembourg, with West Germany coming second. The total value of these exports to Holland was in the region of £630,000 in 1960.

Speculating on future trends, Dr. Bels thinks that production will reach 12 million pounds a year by 1970, of which half will be exported. He anticipates that home consumption will rise from about 4 oz. per head in 1960 to a pound a head by 1980.

MUSHROOM GROWERS AND THE COMMON MARKET

Growers more than most people are aware of the economic uncertainties of the times we live in. Unlike industrialists, they have no control over the selling price of their product, yet unlike farmers, they have no feather beds to rest on. What does integration with Europe mean to the grower ?

What is the Common Market?

The Common Market is the name generally used for the European Economic Community, which consists of France, West Germany, Belgium, Holland, Italy and Luxembourg.

These six countries signed the Treaty of Rome in 1957, the object of which boils down to the fact that they all agree to work towards raising their standards of living by economic co-operation.

Of course there is a great deal more to the Treaty than this, but so far as we are concerned now, the intention is to weld the six countries into one economic unit, the "Common Market". Goods will ultimately pass as freely from one country to another as between England, Scotland and Wales.

How does this affect the United Kingdom?

The six countries of the Common Market have agreed to reduce the tariff walls between themselves, while maintaining a united tariff wall against countries outside.

For example, let us say that in 1957 a French car exported to Germany paid 20% import duty. So did an English car exported to Germany. By 1967, if not before, the French car going to Germany will pay no duty, but the English car will continue to pay the duty.

We are affected therefore where we are exporting to one of the countries of the Common Market in competition with another Common Market Country.

What about Agriculture?

In every country agriculture is one of the essential industries, and each government gives some sort of support to farmers. At the moment the countries of the Common Market have excluded agriculture from their agreement, but a common policy is being worked out and there is no doubt that shortly the method of supporting farmers in the six countries will be standardised.

Horticulture is *not* included in their negotiations for a common support policy for farmers.

For fruit and vegetables, there will be no duty between members, but a common duty will be levied on imports from outside into the Common Market.

It is proposed to lay down rules regarding quality, competition and so on within the Common Market, so that there will be some control of the movement and sale of fruit and vegetables. However there would be no quotas or tariffs to regulate the flow from one producing country to another.

How will this affect the mushroom grower?

If the United Kingdom does not become a member of the Common Market, then horticulture as a whole will remain protected by tariffs and quotas from Continental imports. As fresh mushrooms are not exported to the Common Market, the internal re-arrangements of the six countries will not affect sales, but exporters of canned mushrooms can expect greatly increased competition within the Common Market.

The effect will be indirect; if the exclusion of the United Kingdom from the Common Market should lead to a levelling off of our standard of living, then growers can expect the demand for mushrooms to remain static, or even contract. If the overall standard of living in the Common Market continues to rise sharply, then Continental mushroom industries may flourish, reaching a level of efficiency that will permit them to break into the home market despite protective tariffs.

Why has the United Kingdom not joined the Common Market?

Because our world economic position is unique. We already operate a system of preferential trade agreements. Our manufactured goods go to Commonwealth countries and pay reduced tariffs, while Commonwealth exports come into this country at preferential rates.

To join the Common Market would have meant giving up Commonwealth preference and taking on European preference. There does not seem to be any possible middle course, for neither the Commonwealth countries nor the Common Market seem prepared to give "country membership" terms.

Furthermore, we have been sustained by our farmers through two world wars. Nevertheless we are essentially an industrial nation. Fundamentally we live by what we make and not by what we grow, yet our instinct tells us to maintain a healthy agriculture in case of war.

None of the Common Market countries suffer from this "split personality" to the same degree. Nor have they preferential trade systems as we have.

Why cannot we join the Common Market on a "restricted membership" basis?

Unfortunately the Common Market is now a going concern, with trade between the six countries rising, unemployment, even in Italy, going down, and productivity leaping ahead.

If we wish to become a member of the Common Market we shall have to apply "on the usual form", and take the chance of our application being refused.

Holland, Italy and especially France, have agricultural and horticultural surpluses. They do not wish to open their frontiers to the unrestricted entry of our manufactured goods if we are going to put quotas and duties on their agricultural and horticultural produce.

It appears that the United Kingdom can only go into the Common Market by signing the Treaty of Rome—and accepting all the terms specified in it.

Does signing the Treaty of Rome involve much else?

It provides for a gradual integration of the economies of the member countries. Not only trade should flow without restriction between the six countries. Labour must also be free to move. Just as an unemployed miner in South Wales can go after work in London, so an unemployed Sicilian will be able to seek work in Luxembourg.

It is intended that such things as national welfare insurance schemes, employment, and working conditions should be levelled up between the six countries.

Finally the Treaty makes provision for the setting up of special institutions including an Assembly, a Council, a Commission and a Court of Justice.

It is inevitable that members of the Common Market must surrender some of their national sovereignty. The ultimate aim of the more "European" thinkers is that the Common Market shall become a political as well as an economic unit —a sort of United States of Western Europe.

If this is so, why does anyone want us to join the Common Market?

If either the advantages or disadvantages had the lead, there would be no argument. In fact, this question splits the country right down the middle!

Vehement Trade Unionists are finding themselves shouting from the same bed as die-hard Empire Loyalists. Big business interests are aligned with pro-European Socialists. Consequently the ordinary man in the street is subjected to so many blasts of argument that he has considerable difficulty in staying on his feet.

It all depends on how you look at it—and heaven knows how many ways there are to look at it!

Roughly it looks like this. Those who want us to join claim that it will mean an enormous, unrestricted market for our manufactured goods, and that the increased trade will outbalance our losses in trade with the Commonwealth. They agree that there will be some sorting out, but in the end we shall all be better off.

The opponents point out that we have never looked to Europe for trade; that we shall sacrifice Commonwealth trade only to be flooded with European goods, making little headway ourselves. That while some particular industries may benefit, a great deal more will suffer. In particular, horticulture will be dealt a body blow, and agriculture may have difficulty in remaining on its feet.

You have mentioned what might happen if we stay out. What can mushroom growers expect if we join the Common Market?

Well, mushrooms are not comparable with tomatoes, or fruit. They must be marketed quickly. You can grow a tomato in Sicily, pick it green, and by the time it is sold in England it will be ripe, if tasteless.

So that means shipping mushrooms by air if the growing area lacks a fast train and boat service to London. In practice, the main source of imports would be Holland, with France second and Belgium third.

Many rude things have been said about British horticulture, especially about its inability to stand up to Continental imports without tariff

and quota support. But the mushroom industry is probably the most efficient in Europe, if not the world. It has faced keen competition within itself, and already the less efficient growers have been weeded out.

In fact, the keen competition that already exists may prove to be the first line of defence against invasion from abroad. Only a fat market and good prices will make it worth while to import mushrooms.

Taking the long view, British mushroom growers should be able to compete with continental growers, and if their productivity continues to rise, there is no good reason why our mushrooms should not invade the Continent.

But what about the short view?

There, as Hamlet said, lies the rub! If we go into the Common Market, there is likely to be a considerable amount of sorting out in the glasshouse industry. It has been estimated that a quarter of the tomato growers, for instance will have to turn to other occupations.

It seems inevitable that they will turn to mushroom growing. They will have heated glass, suitable for conversion, and probably a fair amount of know-how.

So taking the short view, entry into the Common Market may mean a considerable area of glass going down to mushrooms over the next several years, as tomato imports increase. This will depress the price, and probably discourage imports of mushrooms. Later, a more streamlined mushroom industry will emerge well able to meet Continental competition and if suitably equipped, may even export to the Continent.

DANISH DEVELOPMENT

by

H. G. Schaffer

During a recent visit to Denmark I had an opportunity of discussing with Mr. C. Riber Rasmussen of the Mushroom Research Station attached to the Royal Veterinary & Agricultural University, Copenhagen, his latest work on through spawning. Broadly speaking this work is a development of the through spawning technique which I described in "Mushroom News" in April 1960 and which is now practised by a number of British growers. As Mr. Rasmussen explained to me, the old method of planting the spawn on the surface of the bed was based on the idea that the mushroom fruiting bodies grew on the surface in the same way as a plant. In fact the spawn produces mycelium right through the compost. It has been realised for a long time that the mushroom crop was not taking all the nutrition from the bed.

The value of through spawning was proved by an experiment with

Mr. Riber Rasmussen, now one of the most outstanding figures in the international mushroom scene.

eight-inch beds given three weights of spawn, put on by the normal top sown method and the through spawn method. This was the result:

Weight of spawn	With through spawning	With top spawning
After 28 *picking days*		
75 grams	10.2 kilos	9 kilos
150 grams	13 ,,	9.8 ,,
300 grams	15.1 ,,	9 ,,
After 89 *picking days*		
75 grams	18.6 kilos	23.6 kilos
150 grams	24.2 ,,	23.3 ,,
300 grams	27.6 ,,	22.6 ,,

These figures represent production for a square metre of bed (10.78 square feet). A kilo is just under 2¼lbs., so comparable figures in British terms can easily be worked out. The conclusions are striking. Increasing the quantity of spawn on the surface has no value but there is an appreciable rise in output when it is mixed throughout the compost.

Mr. Rasmussen also devised an experiment to ascertain how far the mushroom fruiting bodies would go in search of nutrient. He designed trays four inches by four inches in lengths of one to six feet. At the end of each tray an area of 16 square inches was cased and cropped, the rest of the tray being covered with polyethylene, which precludes mushroom development. At the end of each tray, manure treated with isotopes P.32 and Ca 35, supplied by the Danish Atomic Energy Institution was inserted. Thus if the mushrooms showed traces of the isotopes, the nutrient must have been drawn from the extreme end of the tray. On the first flush, it was found that the mushrooms had drawn from the trays 12, 24, and 36 inches long, but the second flush drew from the 72 inch tray. The result was the same whether the trays were placed horizontally or vertically. As cropping continued, the highest production came from the longer trays and was in proportion to the length of tray.

In his next experiment, Mr. Rasmussen plans to take a normal crop with through spawning from beds four feet deep. A preliminary test with this depth gave ¾lb. per square foot on the first flush and he anticipates that later flushes will show much higher yields.

"More work has to be done" he told me, "but we can say that we are finding ways of taking a bigger weight of mushrooms from a given quantity of compost and that the future may see longer cropping from deeper beds, with production averaging about 11lbs. per square foot."

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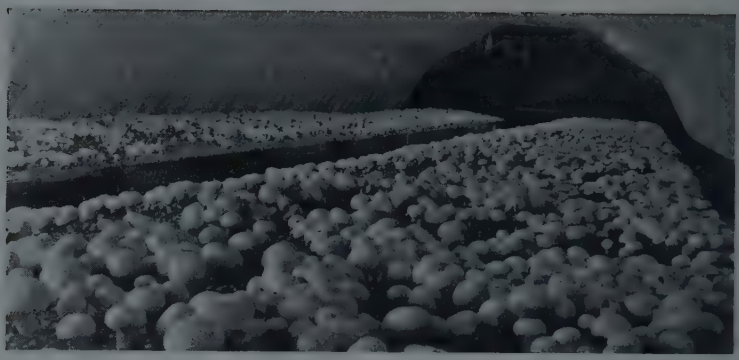

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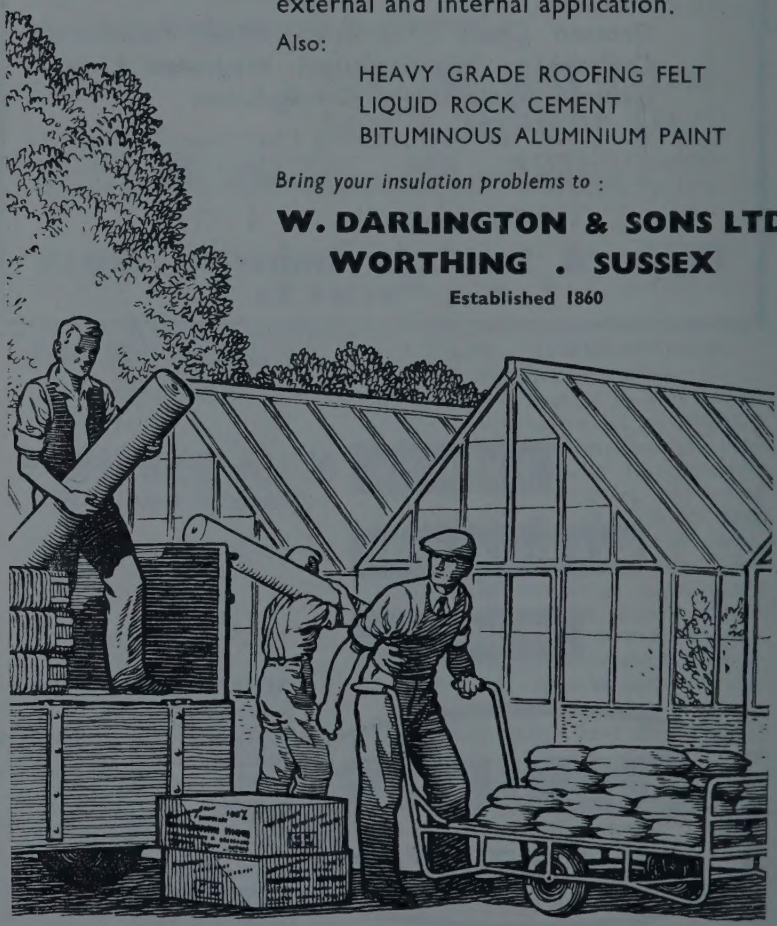

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FRED BRIDGE, Smithfield Market, Manchester 4 Tel.: Deansgate 4835 & 2802. Telegrams: Fred Bridge, Manchester. Established 1888

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